Effluent 002B – TCE Exceedance in December 2016 and Plan of Action

The TCE concentration in the sample from outfall 002B (groundwater treatment plant effluent) was 12.8 ppb this month, compared to a permit limit of 5 ppb.

We have attributed this exceedance to a brief period of underperformance of the air stripper, at the time of sampling, and carbon polishing vessels that are nearing exhaustion and require replacement.

The reasons for this conclusion are as follows:

1. The vault transfer pumps were engaged, shortly before sample collection, increasing the influent loading on the air stripper from approximately 50 gpm to 100 gpm and continued at this rate through the sampling period with no adjustment to air flow through the stripper. The resulting air to water flow ratio (the ratio of the volumetric air flow to the volumetric water flow) was not sufficient to maintain the necessary air stripping efficiency (98.5% removal of TCE at the time of sample collection compared to 99.9% removal typically maintained) which resulted in a TCE concentration of 14.8 ppb post air-stripper (compared to the <1 ppb typically achieved).
    a. Additional technical information: The equalization tank transfer pump, which transfers groundwater from the influent equalization tank to the top of the air stripper, is run on a VFD allowing for automatic speed adjustments to sync the air stripper loading rate to the total influent flow rate at any given time. However, the control of air flow through the stripper is a manual process involving alteration of valving on the pressure and/or vacuum side of the blower.
2. In addition, the polishing carbon vessels were unable to reduce this increased level of TCE after the air stripper (14.8 ppb) to below the permit limit of 5 ppb prior to discharge (002b) as they are likely nearing exhaustion.

The following corrective actions were performed and/or are planned:

1. The air stripper blower valve on the vacuum side was opened an additional notch increasing the vacuum within the air stripper to the high end of the operable range (28 in-H_2O) with the influent transfer pump operating at 100 gpm to immediately increase the air stripping efficiency.
2. Currently there is no instrumentation in place to monitor and record air flow through the air stripper (air flow is controlled and set by comparing water flow to vacuum in the air stripper and across the trays). A pitot tube and magnehelic gauge have been ordered and will be installed on the air stripper to allow for continued monitoring of air flow through the stripper. This information will be coupled with water flow through the stripper to monitor and adjust operating conditions based on changing air to water flow ratios at the air stripper. This will result in better control of air stripping efficiency moving forward.
3. Perform a carbon change out for two of the four carbon vessels in January 2017. Mid-fluent samples collected during January will determine whether the other two vessels also require changing.